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Simulations of Profile Effects for Large Area

ICP Sources},* P. VITELLO, R. BERGER, G. DIPESO, G.J. PARKER,
and N. TISHCHENKO, LLNL - Recent developments in the application of high density plasmas to ultra large scale integrated circuit manufacturing has lead to a need to develop time-dependent multi-dimensional plasma simulation models. We present results here of a comparison between computer modeling and experimental results from the LLNL Large Area ICP Source. The Large Area Source is 30" diameter and is designed to study 400 mm processing. Computer simulations using the 2-D fluid code, INDUCT95, are used to explain variations in the plasma density profile measurements as a function of inductive power, pressure, coil design, and gas. Both Argon and N₂ discharges are considered. We show that there is excellent agreement between simulation and experimental data. Simulations show that high uniformity can be maintained when varying pressure if the chamber aspect ratio is also varied.

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